

Attorney Docket No.: 201440-9001**REMARKS**

No amendments have been made in this Response to Final Office Action. Therefore, Claims 1- 11 remain pending for prosecution.

The undersigned would like to thank Examiner Elahee for granting an interview on March 23, 2006 (the "Interview"). During the Interview, Examiner Elahee clarified some of the rejections in the Office Action by indicating the elements in U.S. Patent No. 4,721,962 ("Gorzel") he felt corresponded to certain limitations in the claims of the Pending Application. Specifically, Examiner Elahee identified element 11 in Gorzel as a "grounding pattern," element 30 as an "internal antenna," element 17 as a "feeding terminal" and element F3 as an "antenna metal element." In addition, Examiner Elahee indicated that he would allow the claims if limited to claiming an F-shaped antenna only. However, no agreement was reached regarding the teaching of the prior art as related to the claims.

**I. Rejection of Claim 6 under 35 U.S.C. § 102**

The Examiner has rejected Claims 1, 2 and 7-9 under 35 U.S.C. § 102(b), as being anticipated by Gorzel.

"A claim is anticipated only if each and every element as set forth in the claims is found, either expressly or inherently in a single prior art reference." *MPEP* §2131; *Verdegall Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987).

The Examiner has failed to set forth a prima facie case of anticipation because he has failed to show that Gorzel teaches all the limitations of Claims 1, 2 and 7-9. With regard to independent Claims 1 and 7, and thus dependent Claims 2, 8 and 9, Gorzel fails to teach (A) a grounding pattern on the printed circuit board; (B) an internal antenna that includes a reflector; (C) a reflector connected with the ground plane; and (D) an output end of an antenna metal element connected with a feeding point of the internal antenna and an input end of the antenna metal element brought in to contact with a feeding terminal formed on the printed circuit board

Attorney Docket No.: 201440-9001

("PCB"). With regard to Claim 1, Gorzel also does not teach (E) a rear case which is provided with a space for accommodating said internal antenna.

Gorzel teaches a transceiver for a portable telephone. *Gorzel, Title*. The Gorzel transceiver includes a PCB 10 with a dielectric material on which electronic elements 12 are connected to a top surface and a conductive surface 11 is connected to the bottom surface. *Gorzel, col. 2, lns. 41-53*. The conductive surface 11 is divided into three regions F1, F2 and F3 by slits 18 and 19. *Gorzel, col. 2, lns. 54-59*. Regions F1, F2 and F3 are decoupled from each other at high frequencies by high-resistance resistors 20 or high-frequency chokes 21 that are located on the top surface of the PCB 10 and connected through the dielectric material to the conductive surface 11. *Gorzel, col. 2, lns. 62-68; Fig. 2*. When the Gorzel transceiver is in transmit mode, F2 serves as the radiating element (the transmission antenna) and F1 and F2 serve as director and reflector elements, respectively. *Gorzel, col. 3, lns. 6-12*. When in receive mode, F3 serves as the receiving element (the reception antenna) and F1 and F2 serve as director and reflector elements, respectively. *Gorzel, col. 3, lns. 1-6*.

To provide signals to region F2 and receive signals from region F3, the Gorzel transceiver has a high frequency element 17 that includes transmission and receiving portions. *Gorzel, col. 3, lns. 27-33*. The receiving portion is capacitively coupled to reception antenna F3 via an antenna terminal 30, connection terminal 33 and a capacitive coupling element 31. *Gorzel, col. 3, lns. 33-35*. Capacitive coupling element 31 is located a distance below reception antenna F3 to form a capacitor with F3 and thus provides a path for signals received by reception antenna F3 to reach the receiving portion of the high frequency element 17. *Gorzel, col. 3, lns. 36-47*. The transmission portion of the high frequency element 17 is connected to transmit antenna F2 via a coaxial cable 35. *Gorzel, col. 3, lns. 59-66*. The outer shield of the coaxial cable 35 is connected to conductive track 39, which is located on the top surface of region F1. *Gorzel, col. 3, lns. 66-68; Fig. 2*. The inner conductor 36 of the coaxial cable 35 is connected to conductive track 37, which is also located on the top surface of region F2. *Gorzel, cols. 3-4, lns. 68 and 1-2, respectively; Fig. 2*.

**A. Gorzel fails to teach a grounding pattern on the printed circuit board**

In the Office Action, the Examiner states that the conductive plane 11 in Gorzel is a grounding pattern on the printed circuit board 10. However, this interpretation is inconsistent

Attorney Docket No.: 201440-9001

with the express teachings of Gorzel, which clearly indicates that conductive surface 11 is not a ground plane but three regions that radiate and receive electromagnetic signals. As described above, conductive surface 11 is segmented into three regions F1, F2 and F3 by slits 18 and 19. When the antenna is in receive mode, F1 is the director, F3 is the reflector and F2 is a receiver. When the transceiver is in transmit mode, F1 is a director, F3 is a radiator and F2 is a reflector. In other words, the conductive surface 11 forms a transmit and receive antenna.

Further, conductive plane 11 does not teach a grounding plane because there is nothing in Gorzel that even suggests that the conductive plane 11 is tied to ground. The Examiner stated in the Interview that all PCBs include a ground plane. However, the Examiner has not shown that that the conductive plane 11 in Gorzel is a ground plane. In fact, Gorzel teaches the opposite—that the conductive plane 11, as segmented by slits 18 and 19, forms separate transmit/reflect, receive/reflect and directive elements.

**B. Gorzel fails to teach a reflector**

Gorzel does not teach a reflector as the term is understood by one of ordinary skill in the field of antennas. As used to describe an antenna, the term "reflector" refers to a parasitic element that is driven solely by electromagnetic coupling with the driven element of the antenna. However, the reflector is located behind the driven element and reflects the signal produced by the driven element that radiates in an undesired direction. In Gorzel, the antenna includes three regions (F1, F2 and F3) oriented along their longitudinal axes in the same plane. When the Gorzel antenna is in a transmit mode, region F3 is the driven element and regions F1 and F2 are electromagnetically coupled to region F3 to form a radiating surface with an effective length corresponding to the wavelength of the median radiated frequency. A similar action occurs when the antenna is in the receive mode. The behavior of the Gorzel antenna as a full-wavelength antenna is shown by the current graphs in Fig. 1. Thus, Gorzel does not disclose a "reflector" as term is understood by one of ordinary skill in the art of antennas.

**C. Gorzel fails to teach an internal antenna**

In the Office Action, the Examiner states that element 30 in Gorzel teaches an internal antenna. However, there is nothing in Gorzel to indicate that element 30 is an antenna. As discussed above, Gorzel describes element 30 as an "antenna terminal" that is connected between

Attorney Docket No.: 201440-9001

the connection element 33 and the receiving portion of the high frequency module 17. *Gorzel*, col. 3, ln. 30. Antenna terminal 30 communicates a signal received by region F2 (and sent through coupling element 31 and connection element 33) to the receiving portion of the high frequency module 17.

**D. Gorzel fails to teach a reflector connected with the ground plane**

The Examiner states that Gorzel teaches a reflector connected with the ground plane. As indicated above, the Examiner asserts that the conductive surface 11 of Gorzel is a ground plane. However, the Examiner does not identify a reflector in the Gorzel antenna and Gorzel contains no teaching of a reflector connected with a ground plan.

**E. Gorzel fails to teach an antenna metal element connected to a feeding point of the internal antenna and brought into contact with a feeding terminal formed on the PCB (Claim 1)**

During the Interview, the Examiner stated that F3 is an antenna metal element that is located on the top portion of the PCB 10. As discussed above, F3 is a region in conductive surface 11, which is located on the bottom surface of the PCB 10. In addition, Claims 1 and 7 require the antenna metal element to connect with the internal antenna on one end and the PCB on the other end. Fig. 1 of Gorzel clearly shows that F3 does not connect with the element 30, which the Examiner asserts is the internal antenna. With regard to the PCB, the Examiner does not identify the teaching in Gorzel of a feeding point on the PCB. Therefore, F3, which the Examiner believes to be the antenna metal element, cannot be brought into contact with a feeding point on the PCB because Gorzel does not teach such a feeding.

**F. Gorzel fails to teach a rear case which is provided with a space for accommodating said internal antenna**

The Examiner states that Gorzel teaches a rear case that is provided with a space for accommodating said internal antenna because a rear case is inherent for a telephone housing. However, it is not inherent that the space for the internal antenna is in the rear case. For example, a portable communication unit may include a space in a front case for an internal

Attorney Docket No.: 201440-9001

antenna or may include a space in both the front and rear case for accommodating an internal antenna.

Because Gorzel fails to all the limitations of Claims 1, 2 and 7-9, it is respectfully requested that the rejection of Claims 1, 2 and 7-9 be withdrawn.

## **II. Rejection of Claims 3-6, 10 and 11 under 35 U.S.C. § 103**

The Examiner has rejected Claims 3-6, 10, 11 under 35 U.S.C. § 103(a), as being obvious over Gorzel in view of US Patent No. 5,952,975 ("Pedersen").

It is respectfully submitted that the Examiner has failed to establish a *prima facie* case of obviousness because he has failed to show that the cited references teach every limitation of the rejected claims.

"To establish a *prima facie* case of obviousness, ... the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. § 2142 citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

### **A. Rejection of Claims 3, 4, and 10**

Claims 3 and 4 depend from Claim 1 and Claim 10 depends from Claim 7 and thus include all the limitations of Claim 1 and Claim 7, respectively. Therefore, the Examiner has failed to show that the cited references teach all the limitations of these claims for the reasons given Section I of this Response.

Therefore it is respectfully requested that the rejection be withdrawn.

### **B. Rejection of Claim 6**

Claim 6 includes the following limitations: a grounding pattern on a printed circuit board, a reflector, an internal antenna, a reflector connected with a grounding plane, and an output end of an antenna metal element connected with a feeding point of the internal antenna and an input end of the antenna metal element brought in to contact with a feeding terminal formed on the PCB. The Examiner has failed to show that the cited references teach these limitations for the reasons given above in Sections IA, IB, IC, ID and IE, respectfully.

It is therefore respectfully requested that the rejection be withdrawn.

Attorney Docket No.: 201440-9001**C. Rejection of Claim 11**

Claim 11 includes the following limitations: a grounding pattern on a printed circuit board, a reflector (reflecting plane), an internal antenna, and a reflector connected with a grounding plane (pattern). The Examiner has failed to show that the cited references teach these limitations for the reasons given above in Sections IA, IB, IC, and ID, respectfully.

It is therefore respectfully requested that the rejection be withdrawn.

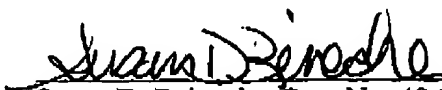
Attorney Docket No.: 201440-9001**Conclusion**

In view of the amendments and remarks set forth in this Amendment and Response to Office Action, it is respectfully submitted that the Pending Application, including Claims 1-11, is in condition for allowance. Therefore, it is respectfully requested that the foregoing amendments be entered, and the Pending Application be promptly allowed.

The Examiner is invited to contact the undersigned if such contact would in any way facilitate and expedite the prosecution of this application.

Respectfully submitted,

Date: May 11, 2006

  
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